

SUPPORT FOR THE AMENDMENT

Support for the amendment to claim 1 is found in claim 6 as originally presented. No new matter would be added to this application by entry of this amendment.

Upon entry of this amendment, claims 1, 3-5 and 7-8 will now be active in this application.

### REQUEST FOR RECONSIDERATION

The claimed invention is directed to a packaged tea beverage.

Catechin containing packaged beverages are sought based on reports of favorable physiological effects. Low catechin concentrations typically found in tea extracts have led to investigations of packaged beverages having an enhanced catechin content. However, increased catechin content has yielded additional problems with astringency and appearance, especially after **storage**. Storage stability of non-polymer catechins is closely related to the stabilities of color tone and taste (see Wang et al. *J. Agric. Food Chem.* 2000, 48, 4227-32 attached) Thus, catechin containing packaged beverages which have good astringency and bitterness characteristics and **storage stability** are sought.

The claimed invention addresses this problem by providing a packaged beverage comprising 0.01 to 1.0 wt. % of non-polymer catechins, quinic acid, a sweetener consisting essentially of an artificial sweetener, 0.0001 to 0.5 wt. % of sodium ions and 0.001 to 0.2 wt % of potassium ions, at a pH of 2-6 and a ratio of quinic acid to non-polymer catechins of 0.0001 to 0.5, the content of oxalic acid, if any being limited to be not greater than 0.06 relative to the weight of non-polymer catechins. Applicants have discovered that concentrations of 0.0001 to 0.5 wt. % of sodium ions and 0.001 to 0.2 wt % of potassium ions to provide for a catechin containing beverage having good drinking characteristics as well as taste and color tone **stabilities**. Applicants have further noted that the stability effect is particularly enhanced when the sweetener consists essentially of an artificial sweetener. Such a packaged beverage is nowhere disclosed or suggested in the cited references.

The rejections of claims 1, 3-6 and 8 under 35 U.S.C. §103(a) over Ohishi et al. U.S. 20030077374 in view of Kuznicki et al. U.S. 5,681,569, Ekanayake et al. U.S. H001628 H and Broz U.S. 2002/0197376 and of claim 7 under 35 U.S.C. §103 (a) as applied above, in further view of Tsai et al. U.S. 4,946,701 and *Teach Me Tea Cha* are respectfully traversed.

None of the cited references disclose or suggest that a packaged beverage containing 0.0001 to 0.5 wt. % of sodium ions and 0.001 to 0.2 wt % of potassium ions, in conjunction with a sweetener, especially an artificial sweetener, would provide **long term** drinkability or an improved **storage stability**.

Ohishi et al. now U.S. 7,029,718 describes a beverage containing non-polymer catechins and quinic acid and as noted on page 5 of the official action, **fails** to describe a concentration of potassium ions of 0.001 to 0.2 wt.%.

The examiner notes paragraph [0039] and its citation for the inclusion of fruit juice, which may contain potassium ions as basis to assert that the claimed range of 0.001 to 0.2 wt. % is obvious. The examiner has further cited to Kuznicki et al. as describing an electrolyte component of a cellular hydration beverage as containing 0.005 to 0.008 wt. % of potassium (column 5, lines 11-18).

However, there is no suggestion that a concentration of 0.0001 to 0.5 wt. % of sodium ions and potassium ion of from 0.001 to 0.2 wt.% in conjunction with an artificial sweetener would provide for enhanced long-term drinkability and storage stability.

As evidence of the improved long-term drinkability and storage stability resulting from a potassium ion concentration as claimed, the examiner's attention is again directed to the data appearing on pages 26-29, Tables 1 and 2, a portion of the data being reproduced below:

[Table 1]

Formulations	Ex. 1	Ex. 2	Ex. 3
Green tea extract A	1.00	0.30	1.00
Green tea extract B	-	-	-
Green tea extract C	-	-	-
Quinic acid	-	-	-
Ascorbic acid	0.03	0.03	0.03
Citric acid	0.2	0.2	0.2
Trisodium citrate	0.1	0.1	0.1
Fruit extract	-	-	2.00
Glucose	-	-	-
Artificial sweetener	5.00	5.00	3.00
Sodium chloride	0.05	0.05	0.05
Potassium chloride	0.02	0.02	0.02
Flavor ingredient	0.10	0.10	0.10
Deionized water	Balance	Balance	Balance
Total amount	100	100	100
pH of beverage	3.5	3.5	3.5
Non-polymer catechins (wt%)	0.22	0.07	0.22
Quinic acid/non-polymer catechins ratio	0.020	0.020	0.020
Oxalic acid/non-polymer catechins ratio	0.01	0.01	0.01
Na content in beverage (mg/100 mL)	47	47	47
K content in beverage (mg/100 mL)	44	18	44
Long-term drinkability	A	A	A
Stability of bitterness and astringency	A	A	A
Feeling as the beverage passed down the throat	A	A	A
Color tone stability	A	A	A
Content of non-polymer catechins observed just after storage (wt. %)	0.215		0.110

[Table 1 (Cont'd)]

Formulations	Ex. 4	Ex. 5	Ex. 6
Green tea extract A	1.00	-	4.00
Green tea extract B	-	0.08	-
Green tea extract C	-	0.20	-
Quinic acid	-	-	-
Ascorbic acid	0.03	0.03	0.03
Citric acid	0.2	0.2	0.2
Trisodium citrate	0.1	0.1	0.1
Fruit extract	-	-	-
Glucose	2.00	2.00	7.00
Artificial sweetener	3.00	3.00	5.00
Sodium chloride	0.05	0.05	0.05
Potassium chloride	0.02	0.02	0.02
Flavor ingredient	0.10	0.10	0.10
Deionized water	Balance	Balance	Balance
Total amount	100	100	100
pH of beverage	3.5	3.4	3.5
Non-polymer catechins (wt%)	0.22	0.19	0.89
Quinic acid/non-polymer catechins ratio	0.020	0.023	0.020
Oxalic acid/non-polymer catechins ratio	0.01	0.009	0.01
Na content in beverage (mg/100 mL)	47	47	47
K content in beverage (mg/100 mL)	44	20	151
Long-term drinkability	A	A	B
Stability of bitterness and astringency	A	A	A
Feeling as the beverage passed down the throat	A	A	A
Color tone stability	A	A	B
Content of non-polymer catechins observed just after storage (wt. %)	0.190		

[Table 2]

Formulations	Comp. Ex. 1	Comp. Ex. 2	Comp. Ex. 3
Green tea extract A	1.00	-	1.00
Green tea extract B	-	-	-
Green tea extract C	-	0.23	-
Quinic acid	-	-	-
Ascorbic acid	-	0.03	0.03
Citric acid	-	0.2	0.2
Trisodium citrate	0.33	0.1	0.1
Fruit extract	-	-	-
Glucose	-	-	-
Artificial sweetener	5.00	5.00	5.00
Sodium chloride	0.05	0.05	2.5
Potassium chloride	0.02	0.02	0.02
Flavor ingredient	0.10	0.10	0.10
Deionized water	Balance	Balance	Balance
Total amount	100	100	100
pH of beverage	6.5	3.5	3.5
Non-polymer catechins (wt%)	0.22	0.19	0.22
Quinic acid/non-polymer catechins ratio	0.020	0.00001	0.020
Oxalic acid/non-polymer catechins ratio	0.01	0.00001	0.01
Na content in beverage (mg/100 mL)	108	47	1011
K content in beverage (mg/100 mL)	44	6	44
Long-term drinkability	B	C	D
Stability of bitterness and astringency	D	C	C
Feeling as the beverage passed down the throat	D	B	D
Color tone stability	D	B	C

[Table 2 (Cont'd)]

Formulations	Comp. Ex. 4	Comp. Ex. 5	Comp. Ex. 6
Green tea extract A	1.00	1.00	-
Green tea extract B	-	-	0.35
Green tea extract C	-	-	-
Quinic acid	-	-	2.0
Ascorbic acid	0.03	0.03	0.03
Citric acid	0.2	0.2	0.2
Trisodium citrate	0.1	0.1	0.1
Fruit extract	-	-	-
Glucose	-	22.00	-
Artificial sweetener	5.00	3.00	5.00
Sodium chloride	0.05	0.05	0.05
Potassium chloride	0.9	0.02	0.02
Flavor ingredient	0.10	0.10	0.10
Deionized water	Balance	Balance	Balance
Total amount	100	100	100
pH of beverage	3.5	3.5	3.5
Non-polymer catechins (wt%)	0.22	0.22	0.12
Quinic acid/non-polymer catechins ratio	0.020	0.020	16.7
Oxalic acid/non-polymer catechins ratio	0.01	0.01	0.06
Na content in beverage (mg/100 mL)	47	47	47
K content in beverage (mg/100 mL)	516	44	27
Long-term drinkability	D	C	C
Stability of bitterness and astringency	C	C	D
Feeling as the beverage passed down the throat	D	D	D
Color tone stability	C	D	D

Comparative example 4, having a non-polymer catechin content, quinic acid/non-polymer catechin ratio, sweetener content and sodium ion content as claimed, but having a potassium ion content of 0.516%, **in excess of the claimed 0.2 wt. %** was assessed as “not suited for drinking” (D) by thirty male monitors, ingesting the beverage for one month. Further the **stability to bitterness and astringency** was assessed as “changed “ (C) when observed over the course of 7 days and the color tone stability over the course of one month was assessed as “changed” (C). Thus, independent of any **initial effects** of the content of sodium and potassium ions, applicants observe an improvement in **stability** of bitterness and

astringency as well as **stability of** color tone. While the office action makes assertions as to expectations for drinkability, there is no suggestion of any improvement in long term stability.

Further more, comparative example 1, having non-polymer catechin, quinic acid, sweetener, sodium, potassium, (B)/(A) ratio as claimed, but a pH in excess of the claimed 2-6 demonstrated substantial changes in bitterness and astringency stability as well as color tone stability.

Comparative example 2, having non-polymer catechin, quinic acid, sweetener, sodium, potassium, pH as claimed, but a (B)/(A) ratio below that claimed of 0.0001 demonstrated changes in bitterness and astringency stability and slight changes in color tone stability.

Comparative example 3, having non-polymer catechin, quinic acid, sweetener, potassium, (B)/(A) ratio, pH as claimed, but a sodium content exceeding the claimed 0.5 wt. % demonstrated changes in bitterness and astringency stability as well as in color tone stability.

Comparative example 5, having non-polymer catechin, quinic acid, sodium, potassium, (B)/(A) ratio, pH as claimed, but a sweetener content exceeding the claimed 15 wt. % demonstrated changes in bitterness and astringency stability and substantial changes in color tone stability.

Comparative example 6, having non-polymer catechin, quinic acid, sweetener, sodium, potassium, pH as claimed, but a (B)/(A) ratio exceeding that claimed of 0.5 demonstrated substantial changes in bitterness and astringency stability as well as in color tone stability.

Page 5 of the official action describes some confusion when examining example 1 and comparative example 1, but the pH deficiency should clarify these results.



In contrast, each of examples 1-6 in which the non-polymer catechin content, quinic acid/non-polymer catechin ratio, sodium ion content as claimed, and potassium ion content was as claimed, were assessed as “suitable” or “suited a little” (A) and (B) for drinkability. The stability to bitterness and astringency was assessed as “not changed “ (A), the throat feeling was assessed as “good” (A) and the color tone stability was assessed as “not changed” (A) or “slightly changed” (B). Thus, by ensuring a potassium ion concentration of from 0.001 to 0.2 wt.%, applicants observe measurable improvements in stability of bitterness and astringency and color tone stability.

Even further, applicants observe an increase in storage stability, quantified in terms of non-polymer catechin content, for compositions in which the sweetener consists essentially of an artificial sweetener (example 1) as compared with compositions in which the sweetener further contains another sweetener (fruit extract (example 3), glucose (example 4)). The data is submitted in the form of the declaration of Mr. Masaki Iwasaki, an employee of the Kao Corporation the assignee of the above-identified application. The data from the Iwasaki declaration is reproduced below:

	Examples		
	1	3	4
Content of non-polymer catechins observed just before storage (wt. %)	0.22	0.22	0.22
Content of non-polymer catechins observed just after storage (wt. %)	0.215	0.110	0.190

The data demonstrates a greater non-polymer catechin content when the sweetener consisted essentially of an artificial sweetener as compared with the additional presence of sweeteners of fruit juice or glucose. Thus, sweeteners of fruit juice and glucose are demonstrated to destroy the basic and novel characteristics of the claimed composition in terms of product storage stability.

Such improved stability performance could not have been suggested by the cited references. At best, the references merely suggest inclusion of potassium ions in the composition, but does not suggest that within the claimed range that there would be an enhancement in storage performance.

None of the remaining references have been cited for a disclosure of a potassium ion content and accordingly could not provide any expectation of improved stability and color tone stability resulting from a concentration of potassium ions of 0.001 to 0.2 wt.%.

Therefore, the claimed invention would not have been obvious over the cited references and withdrawal of the rejections under 35 U.S.C. §103(a) is respectfully requested.

The rejection of claims 1-8 under 35 U.S.C. §112, second paragraph is respectfully traversed.

Applicants respectfully submit that the metes and bounds of claim 1 would be clear to those of ordinary skill in the art as to the wt. % basis for the components of non-polymer catechins, sweetener, sodium ions and potassium ions is clearly based on the wt. of the packaged beverage.

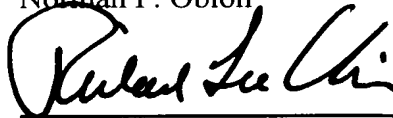
It is noted that the **claim recites** that the packaged beverage contains specific components in specified wt.% amounts. Those of ordinary skill in the art would readily appreciate that the plain meaning of the term wt.% is based on the wt. of the packaged beverage. This interpretation is reinforced by applicants' specification disclosure on page 5, lines 2-3, page 8, lines 5-9 and page 11, lines 13-15 which identify the packaged beverage as containing specific wt.% of each component. While the examiner warns against importation of limitations from the specification into the claim, applicants note that the examiner **must** give the claims the broadest reasonable interpretation **consistent** with the specification M.P.E.P. §2111. Any interpretation of the claim as being based on the wt. % of the green tea extract would be inconsistent with applicants' specification, such that the examiner's possible

interpretation is unreasonable. Thus, since the metes and bounds of the claimed invention are clear to those of ordinary skill in the art, withdrawal of this ground of rejection is respectfully requested.

Applicants submit that this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

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